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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Confirmation No.: 8863
TERRY VICTOR CLAPP	Group Art Unit: 2874
Serial No.: 10/564,133	Examiner: Chad Smith
Filed: January 10, 2006	Attorney Docket: 2143.000300/KDG (SKG/JB/G21349US)
For: ELECTRO-OPTIC GAP-CELL FOR WAVEGUIDE DEPLOYMENT	**CUSTOMER NO. 23720**

RESPONSE TO FINAL OFFICE ACTION DATED DECEMBER 18, 2008

Sir:

This paper is submitted as a response to the Office Action dated December 18, 2008, for which the three-month date for response is February 18, 2009. This response is being electronically filed on January 27, 2009 before the due date therefore, it is timely filed.

If an extension of time is required to enable this paper to be timely filed and there is no separate Petition for Extension of Time filed herewith, this paper is to be construed as also constituting a Petition for Extension of Time Under 37 CFR § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

It is believed that no fee is due; however, should any fees under 37 C.F.R. §§ 1.16 to 1.21 be required for any reason, the Commissioner is authorized to deduct said fees from Williams, Morgan & Amerson's P.C. Deposit Account 50-0786/2143.000300.

Reconsideration of the application is respectfully requested.

AMENDMENT

I. IN THE CLAIMS:

Please amend the claims as follows:

Claim 1. (Canceled)

Claim 2. (Canceled)

Claim 3. (Currently Amended) The apparatus of claim ~~1~~13, wherein the at least one edge having a non-zero radius of curvature comprises at least one edge having a non-zero radius of curvature in a plane substantially parallel to a surface of the substrate.

Claim 4. (Currently Amended) The apparatus of claim ~~1~~13, where in the first optical transmission medium forms a waveguide.

Claim 5. (Original) The apparatus of claim 4, wherein the waveguide is oriented approximately perpendicular to a transverse edge of the slot.

Claim 6. (Original) The apparatus of claim 5, wherein the waveguide terminates approximately at the transverse edge of the slot.

Claim 7. (Original) The apparatus of claim 4, wherein the waveguide and the slot are formed at a relative angle such as to reduce reflections causing unwanted light to travel in either direction in the waveguide.

Claim 8. (Original) The apparatus of claim 4, wherein at least a portion of the waveguide is oriented approximately parallel to a transverse edge of the slot.

Claim 9. (Currently Amended) The apparatus of claim ~~1~~13, where in the second optical transmission medium is at least one of a waveguide, a ring resonator, a whispering gallery mode object, a grating defined cavity, a photonic crystal, and a photonic band-gap object.

Claim 10. (Currently Amended) The apparatus of claim ~~1~~13, further comprising a third optical transmission medium.

Claim 11. (Original) The apparatus of claim 10, wherein the third optical transmission medium is at least one of a waveguide, a ring resonator, a whispering gallery mode object, a grating defined cavity, a photonic crystal, and a photonic band-gap object.

Claim 12. (Canceled)

Claim 13. (Allowed) An apparatus, comprising:

a first optical transmission medium formed in at least a portion of a device layer;

a second optical transmission medium formed in at least a portion of the device layer; and

a slot formed in at least a portion of the device layers, wherein the slot has at least one curved edge, and wherein the slot is disposed adjacent to the first and second transmission media, wherein the slot is adapted to receive a phase adjusting element and wherein the phase adjusting element comprises:

a substrate having a shape selected to permit the phase adjusting element to be inserted into the slot;

an opening formed in the substrate so that the opening is proximate the waveguide when the phase adjusting element is inserted in the slot; and

an electro-optically active material deployed in the opening.

Claim 14. (Currently Amended) The apparatus of claim 13, ~~wherein the~~comprising at least one electrode that is deployed on the substrate.

Claim 15. (Allowed) The apparatus of claim 14, further comprising at least one conductive element coupled to the at least one electrode deployed on the substrate of the phase adjusting element.

Claim 16. (Currently Amended) The apparatus of claim ~~1~~13, wherein the phase adjusting element comprises an electro-optically active liquid introduced into the slot, said electro-optically active liquid having at least one molecular axes that can be adjusted by changing a potential applied across said electro-optically active liquid.

Claim 17. (Currently Amended) The apparatus of claim ~~1~~13, wherein the phase adjusting element introduced into the slot comprises a material that becomes increasingly electro-optic when introduced into the slot.

Claim 18. (Currently Amended) The apparatus of claim ~~1~~13, wherein a surface of the slot is modified to provide at least one of an interpenetrating polymer matrix, a carbon nanotube, an auxiliary dopant, and a surface treatment resulting from an introduced material.

Claim 19. (Currently Amended) The apparatus of claim ~~1~~13, wherein a surface of the slot has a preferred molecular orientation.

Claim 20. (Canceled)

Claim 21. (Currently Amended) An apparatus, comprising:

a first optical transmission medium formed in at least a portion of a device layer;

a second optical transmission medium formed in at least a portion of the device layer;

a slot formed in at least a portion of the device layers, wherein the slot has at least one curved edge having a non-zero radius of curvature, and wherein the slot is disposed adjacent to the first and second transmission media;

a phase adjusting element deployed in the slot; and

at least one electrode deployed proximate the slot, the at least one electrode being adapted to provide at least a portion of a variable electric field within the slot, the phase adjusting element being responsive to the variable electric field so that at least one of a phase, amplitude, or polarization of light propagating through the slot can be adjusted by varying the variable electric field~~The apparatus of claim 20~~, wherein the at least one electrode has at least one curved electrode edge.

Claim 22. (Original) The apparatus of claim 21, wherein the at least one electrode has at least one electrode edge having a non-zero radius of curvature.

Claim 23. (Previously Presented) The apparatus of claim 22, wherein the at least one electrode edge having a non-zero radius of curvature comprises at least one electrode edge having a non-zero radius of curvature in a plane substantially parallel to a surface of the device layer.

Claim 24. (Allowed) An apparatus, comprising:

a substrate;

a device layer formed above the substrate;

a waveguide formed in at least a portion of the device layer;

a slot formed in at least a portion of the device layer and having at least one edge having a non-zero radius of curvature in a plane substantially parallel to a surface of the device layer, wherein the slot allows at least a portion of light propagating in the waveguide to be transmitted from the waveguide to another transmission medium;

at least one electrode deployed proximate the slot, the at least one electrode having at least one electrode edge having a non-zero radius of curvature in a plane substantially parallel to a surface of the device layer and being capable of providing at least a portion of a variable electric field in the slot; and

a phase adjusting element deployed in the slot.

Claim 25. (Allowed) The apparatus of claim 24, wherein the phase adjusting element comprises:

a substrate having a shape selected to permit the phase adjusting element to be inserted into the slot;

an opening formed in the substrate so that the opening is proximate the waveguide when the phase adjusting element is inserted in the slot; and

an electro-optically active material deployed in the opening.

Claim 26. (Allowed) The apparatus of claim 24, wherein the at least one electrode is deployed on the substrate of the phase adjusting element.

Claim 27. (Allowed) The apparatus of claim 24, wherein the slot allows at least a portion of the light propagating in the waveguide to be transmitted from the waveguide to at least one of a waveguide, a ring resonator, a whispering gallery mode object, a grating defined cavity, a photonic crystal, and a photonic band-gap object.

Claim 28. (Canceled)

Claim 29. (Currently Amended) The method of claim ~~28~~40, wherein forming the first optical transmission medium comprises forming a waveguide oriented approximately perpendicular to a transverse edge of the slot.

Claim 30. (Currently Amended) The method of claim ~~28~~40, wherein forming the slot comprises forming the slot such that the waveguide terminates proximate the approximately transverse edge of the slot.

Claim 31. (Currently Amended) The method of claim ~~28~~40, wherein forming the first optical transmission medium comprises forming a waveguide, wherein at least a portion of the waveguide is oriented approximately parallel to a transverse edge of the slot.

Claim 32. (Currently Amended) The method of claim ~~28~~40, where forming the second optical transmission medium comprises forming at least one of a waveguide, a ring resonator, a whispering gallery mode object, a grating defined cavity, a photonic crystal, and a photonic band-gap object.

Claim 33. (Currently Amended) The method of claim ~~28~~40, further comprising forming a third optical transmission medium in the substrate.

Claim 34. (Currently Amended) The method of claim ~~28~~40, wherein deploying the phase adjusting element within the slot comprises deploying an electro-optically active element in the slot, said electro-optically active element having at least one molecular axis that can be adjusted by changing a potential applied across said electro-optically active element.

Claim 35. (Original) The method of claim 34, wherein deploying the electro-optically active element in the slot comprises introducing at least one of a liquid crystal and a polymer dispersed liquid crystal in the slot.

Claim 36. (Previously Presented) The method of claim 34, wherein deploying the electro-optically active element in the slot comprises inserting the phase adjusting element in the slot.

Claim 37. (Original) The method of claim 34, further comprising forming at least one of an interpenetrating polymer matrix, a carbon nanotube, and an auxiliary dopant within the electro-optically active element introduced into the slot.

Claim 38. (Original) The method of claim 37, wherein the at least one of the interpenetrating polymer matrix, the carbon nanotube, and the auxiliary dopant extend to a surface of the slot.

Claim 39. (Original) The method of claim 34, further comprising treating the slot using at least one of silane, silane derivatives, additives that migrate to the surface of the slot, chromophores, stabilization agents, and refractive index modifiers.

Claim 40. (Currently Amended) A method, comprising:

forming a first optical transmission medium in at least a portion of a device layer;

forming a second optical transmission medium in at least a portion of the device layer;

forming a slot in at least a portion of the device layer, wherein the slot has at least one curved edge having a non-zero radius of curvature, and wherein the slot is disposed adjacent to the first and second transmission media;

deploying a phase adjusting element within the slot; and

~~The method of claim 28, further comprising~~ deploying at least one electrode having at least one curved edge proximate the slot such that the at least one electrode is capable of providing at least a portion of a variable electric field in the slot.

Claim 41-55. (Canceled)

REMARKS

Applicant acknowledges and appreciates allowance of claims 13-15 and 24-27.

Claims 21 and 40 have been rewritten in independent form including all the limitations of the base claim and any intervening claims. Claims 1-2, 12, 20, 28, and 41-55 have been canceled. The pending claims have also been amended so that the remaining dependent claims depend from one of the current independent claims. Applicants respectfully submit that the proposed amendments place the present application in condition for allowance and therefore respectfully request that the Examiner enter these amendments. Pursuant to the amendments indicated herein, claims 3-11, 13-19, 21-27, and 29-40 are pending in the present application.

In the Office Action, the Examiner objected to claim 14. This claim has been amended to correct the antecedent basis of "at least one electrode." Applicants respectfully request that the Examiner's objection to claim 14 be withdrawn.

In the Office Action, the Examiner objected to claims 21-23 and 40 but indicated that these claims include allowable subject matter. Claims 21 and 40 have been rewritten in independent form including all the limitations of the base claim and any intervening claims. Claims 22-23 depend from claim 21. Applicants therefore respectfully submit that claims 21-23 and 40 are in condition for allowance.

The remaining claims have been amended to depend from one of the allowed independent claims. Applicants therefore respectfully submit that all of the claims pending in the present application are in condition for allowance.

Pursuant to the amendments presented in the present response, Applicant respectfully submits that the claims pending in the present application are in condition for allowance. The

Examiner is invited to contact the undersigned at (713) 934-4052 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,

Date: January 27, 2009

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